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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 9, 1943

In Gear

See Page 233

A SCIENCE SERVICE PUBLICATION

Do You Know?

Lime phosphates constitute 6/7 of the solids in human bones.

Pea pods and vines, byproducts of canning, are valuable cattle food.

Canning powders and other chemical preservatives should not be used by home canners, warns the U. S. Department of Agriculture; they constitute a health hazard.

A considerable part of the retina of every human eye is *color-blind,* says the Better Vision Institute; the outer edge is totally color-blind, only in the center of the retina are all colors seen.

American hens laid over 6,500,000,000 *eggs* in May, 1943, according to the U. S. Department of Agriculture, an increase of 13% in egg production over the preceding May.

Mexican *bean beetles,* leaf-eating insects with a special taste for beans, do the most damage in the northern states in July and August; they are controlled by special insecticides.

A mixture of two parts sodium fluosilicate, one part phenothiazine, and one part of ordinary wheat flour, is being used successfully on cattle to destroy both sucking and chewing *lice.*

The 1943 fall hunting season for *migratory game birds* which lasts 70 days, begins Sept. 25 in the northern zone, Oct. 15 in the intermediate zone, and Nov. 2 in the southern zone.

One-half the industrial *alcohol* needed in the United States in the next 12 months will be produced by the beverage alcohol industry.

Eye examinations show that about one in every four working persons in their twenties have *visual defects;* at 40, approximately 50% of all workers have defective vision.

Total *food production* in the United States this year is expected to exceed last year's record production by about 5%.

Some 25,000,000 *waterfowl* of various migratory species visited Federal wildlife refuge areas in their southward journey in the fall of 1942; mallards included numbered about 11,600,000.

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Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

SCIENCE NEWS LETTER

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MEDICINE

Meningitis Conquered

Sulfadiazine is the weapon credited with bringing down the death rate in training camp outbreaks to new low point. Outlook for future good.

▶ THE U. S. Army has meningitis licked almost to a standstill, with further victories in sight, it appears from a report by Col. Henry M. Thomas, Jr., medical consultant, Fourth Service Command. (*Journal, American Medical Association,* Oct. 2)

The World War I death rate for meningitis in the U. S. Army was 39%. This was cut to one-fourth (8.8%) during the early months of last winter's outbreak in the Fourth Service Command and during the last two months of the outbreak the death rate was again cut to one-fourth, or 2.1% in 761 cases, Col. Thomas reports.

"It is safe to prophesy," he states, "that the mortality rate for the remainder of this war will be held to a low level."

Sulfadiazine is the weapon chiefly responsible for the amazingly low death rate. However, the second reduction of the death rate to one-fourth its previous figure was not achieved until medical officers and nurses throughout the Fourth Service Command had been "alerted" to awareness of the various symptoms of meningitis especially in its early stages and the need for immediate adequate treatment.

"It seems probable that all members of the medical corps on duty in the zone of the interior during the past few months," Col. Thomas states, "will continue to be on the watch for cases of meningococcic infection and will be familiar with proper treatment."

Prophylactic treatment with sulfadiazine of meningitis carriers has also been used so successfully in the Army during the past few months that Col. Thomas feels it is safe to prophesy that in the coming years the number of cases can be greatly reduced as well as the death rate from this disease.

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CHEMISTRY

Keeps Milk Fresh

Addition of wheat germ oil and edible acids keeps whole milk powder fresh twice as long. Would extend usefulness of supplies for overseas.

▶ WHOLE MILK powder containing minute amounts of wheat germ oil and edible acids will stay fresh about twice as long as untreated milk, research at MacDonald College laboratories, St. Anne de Bellevue, Quebec, shows. If the simple, inexpensive method proves out, it could be employed to extend the usable life of the quantities of dried milk being shipped to war zones from the United States.

Dried milk is so light as to offer striking military advantages, but its use has always been limited by danger that the butterfat would turn rancid. For this reason, the Canadian Research Council asked Dr. W. D. McFarlane of MacDonald College, McGill University, to study natural food materials which gave promise of delaying rancidity in milk powder. Dr. McFarlane now reports that "very striking results" were obtained by adding wheat germ oil formula to the milk equivalent to 0.1% of the butterfat content. The oil is extracted at low temperatures and combined with minute amounts of edible "hydroxy" acids producing a formula more effective than wheat germ oil alone, which has long been known to improve the keeping quality of less stable fats.

The wheat germ oil formula is simply homogenized into a small amount of skim milk, which in turn is poured into the liquid whole milk to be dried. So slight an amount is used that no change can be detected in the color or taste of the milk powder. The germ oil harmlessly oxidizes instead of the butterfat, delaying rancidity and helping to retain the vitamin A content. Dr. McFarlane found that this doubled the life of milk powder, and even before these findings could be published, the Canadian Navy began to use the formula in milk powder tablets for emergency rations.

The immediate military significance of this discovery stems from the fact that so little wheat germ oil is used that our entire dried milk output could be protected with it from existing supplies of the oil. Besides, no new machinery is needed to mix it with the liquid milk. Dried milk would still be packed for export in vacuum cans, but the wheat germ oil would give added protection. This would be especially valuable after cans are opened, and in warm climates.

United States production of dried milk in 1943 is expected to reach 150 million pounds, breaking all records, emphasizing the importance of keeping qualities.

Dr. P. H. Tracy, authority on milk powder at the University of Illinois, has also been working on the problem, and confirms that "wheat germ oil was found to retard the development of an oxidized flavor in powdered whole milk." Dr. Tracy emphasizes that wheat germ oil

YUCCA—This beautiful scene from our Southwest is part of the photographic exhibit now being shown at the Field Museum of Natural History. The Field Museum, incidentally, recently announced the change of its name to Chicago Museum. This print, one of 150 honored by being chosen for the exhibit, was made by Tom Peterson, of El Paso, Texas.

cannot substitute for fine quality in milk powder—that it is simply an added protection.

In connection with this improvement in milk powder, officials of the Food and Drug Administration have pointed out that they know of no barrier to the addition of so slight an amount of pure food materials to milk powder, since no standard for dried whole milk has been set up under the 1938 law.

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ENGINEERING

Design Changes Needed

Warplanes should be planned so that they can be broken down into units that could be carried on standard vehicles. Better servicing would increase air power.

➤ WARPLANES now spend scarcely more than 3% of their time in the air, indicating a need for designs that will permit quicker, easier servicing, Clyde R. Paton and William C. Gould of General Motors' Allison Division told the Society of Automotive Engineers meeting in Los Angeles, during a discussion of servicing aircraft overseas.

Aircraft should be designed, the engineer stated, "so that they can be readily broken down into units, each complete in itself, and of such size as to be readily handled on standard transport vehicles." Grounded planes could thus take to the air again in a short time, as the defective part is removed and a new or overhauled unit dropped into place.

Such units must be packaged to withstand plenty of rough handling during overseas shipment. Trying to protect replacement parts with a "This side up" label means nothing under conditions of military operations.

After the parts have been installed, "tinkeritus" has been found to be a common cause of further trouble. This largely affects inexperienced ground crews who constantly work on engines even when they are in good condition, as well as give careless or faulty service when there is a real need for maintenance work.

From experience overseas, the engineers reported that "everything possible must be done in the design and engineering of aircraft to insure ease of service and maximum durability under the most primitive field conditions."

One of the greatest problems of flyers in advanced theaters of operation is the general lack of spares. Even when replacements have been sent they may never reach their destination, due to the exigencies of war, it was pointed out.

"Personnel can argue for travel priority," the engineers were told, "materiel cannot and frequently fails to move until followed up by special expediters assigned to that problem. Separate flight schedules for personnel and materiel would, with rigid restrictions governing encroachment of one service upon the other, do much to correct this difficulty.

"Another difficulty is that during periods when materiel in transit is off loaded, it frequently is pirated by local supply personnel who find themselves in immediate need of the materiel in their hands."

Shipments may also be diverted at times from their original destination to another point under the pressure of military necessity, the engineers reported. Improvements are now being made to help overcome these problems.

Because of the remoteness of the Southwest Pacific war theater, servicing must depend to a greater extent on salvage operations in lieu of new spares. To help solve this problem, it was proposed at the meeting that manufacturers "undertake a program directed toward developing salvage procedures which require only simple, readily portable hand tools which can be utilized under first echelon conditions."

Science News Letter, October 9, 1943

Movies An Engineering Tool

➤ MOVIES that would never be run at a theater are of dramatic interest to wartime engineers, for they measure and analyze motion and vibration in machinery.

H. D. Jackes of Wright Aeronautical Corporation suggested three problems of the aircraft industry which might be solved by further use of high-speed motion pictures:

1. Flutter of wing and control surfaces on planes.

2. Action of wheel struts and landing mechanisms upon impact with the ground.

3. Failures and vibration of exhaust collector rings. The camera could be located in the engine compartment during flight, for example, to reveal defects in the exhaust system.

Describing uses to which high-speed motion pictures are already being put for recording valve action, oil movements, and motion studies of parts, Mr. Jackes said that film records are particularly useful because they can be easily analyzed by anyone with general engineering experience. In many research problems the movies have been found superior to strain gages, seismic vibration indicators and stroboscopes for motion analysis.

The camera is the same type used to make a "photo finish" at the races. Its value has already been recognized by several industries for studies such as the action analysis of the escapement mechanism of precision clocks and of the shutters on military aerial cameras. Movies are also used in the study of various manufacturing processes, such as blowing spun glass or the action of a high-speed weaving machine.

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Gadget-Laden Trainer

➤ THE gadget-laden training plane developed in this country is now being used by 24 United Nations and more than 10,000 have been American-built since the first model of the series appeared a decade ago, Ralph Ruud of North American Aviation, Inc., announced to the Society of Automotive Engineers.

Its development has paralleled design improvements of combat types to give the best possible training facilities in almost all tactics, from ground strafing to aerial dogfighting to bombardment.

Equipment on the versatile ship includes bomb racks, blind flying instruments, fixed and flexible guns, gun and standard cameras and the other gadgets that military pilots must learn to operate.

Aside from some Air Corps specifications, the development of the trainer has been a "designer's paradise," Mr. Ruud pointed out. As a result a trainer has been produced which is purposely hard to fly yet safe, and resembles combat planes in performance and handling. It is easy to maintain and repair. It comes

as close to indestructibility as any airplane can come. These design features have been developed, the engineers were told, within a plan for low-cost, rapid production.

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Manly Medal Awarded

➤ RESEARCH on oil systems of aircraft has won the Manly Memorial Medal for John Dolza and Harry C. Karcher of General Motors' Allison Division in Indianapolis.

Although the two engineers are the first medalists to be so honored since 1939, the award is available annually for the best paper on theory or practice in the construction of, or research in, aeronautical power plants, parts or accessories. It was established in 1928 to honor Charles M. Manly, designer of the forerunner of modern radial airplane engines. The subject of this year's prize-winning paper was, "Correlation of Ground and Altitude Performance of Oil Systems."

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ENGINEERING

Gas Tanks of Magnesium

Other uses in warplanes, such as turret cases, tail surfacing and parts, has resulted in the tripling of magnesium production.

➤ PRODUCTION of magnesium will soon be more than tripled as better gasoline tanks, turret cases, tail surfacing, and other aircraft parts are developed by use of the feather-weight metal, J. C. Mathes of the Dow Chemical Company, Midland, Mich., reported to the Society of Automotive Engineers meeting in Los Angeles.

Present abundance of magnesium, which is expected to continue under present conditions, will supply the plants now coming into production. By early next year production of magnesium sheet should triple, the engineers were told, and extruded parts should be available in five to ten times the former quantity.

The problem of building fabrication facilities has been complicated since many of the parts have never been made of magnesium before, and their requirements must be determined by further engineering study.

Used to supplement aluminum, the hard, silvery metal helps increase a plane's range, load, speed and maneuverability. Sheet magnesium was reported to be satisfactory for such uses as instrument panels, turret parts, and oil and gasoline tanks.

Twelve gallons more capacity and nine pounds less weight resulted from using magnesium gasoline tanks on the British Spitfire. The tanks are also more resistant to gunfire because the magnesium does not "tulip" and form ragged holes which prevent the coat of bullet-proofing rubber from sealing punctures effectively.

From 11% to 26% weight reduction is achieved by using magnesium sheet for surfacing ailerons, flaps, elevators and tail assemblies, Mr. Mathes reported.

Many researchers have been at work on the problem of part failures due to stress corrosion. Stresses resulting from arc-welding were named by Mr. Mathes as the most serious offenders, but it is now believed that this can be overcome by a stress-relieving process conducted at 400 degrees Fahrenheit for an hour.

Captured Nazi planes have shown a much higher base metal corrosion compared to American magnesium alloys due to impurities. Despite this, no corrosion failures were observed.

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AGRICULTURE

Victory Gardens Produced 8,000,000 Tons of Food

➤ AMERICA'S Victory Garden program for 1943 has proved that Americans can meet emergencies. Approximately 20,000,000 gardens were cultivated. About 4,000,000 acres of land were used for them. Some 8,000,000 tons of food were produced. These are figures of the U. S. Department of Agriculture.

This means that approximately one out of every two families in the country had victory gardens. In the two severe drought areas, the Middle Atlantic states centered about the District of Columbia and the Oklahoma-Texas region, many of the gardens were a failure. Throughout the nation as a whole they produced abundantly. In tonnage the production is as great as that of the food for the entire Army. A soldier uses a ton of food a year. The Victory Garden production amounts to about 125 pounds for every man, women and child in the civilian population.

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FOR STRATOSPHERE—These are supercharger impellers, "fan" blades for the bombers that will fly in the upper air over enemy territory. They are being built in General Electric's Fort Wayne, Ind., plant.

ENGINEERING

Tornado in a Box

A new kind of engine, the gas turbine, simple, compact and economical, and operated by blowing flaming fuel against blades of wheel, may change post-war world.

By J. D. RATCLIFF

➤ UNPUBLICIZED because so much of the work has been veiled in wartime secrecy, a new kind of engine, the gas turbine, has been developed. It is the simplest and most compact engine ever invented and one of the most economical. It is already in use in scores of industrial plants and is so successful that it seems destined to be one of the things that will alter the aspect of the post-war world.

The steam engine, the steam turbine, the Diesel, the gasoline engine—successively each new means of converting fuel into moving power has created new industries and revolutionized old ones. The gas turbine seems certain to do the same.

The principle of the gas turbine is simple; it is essentially a windmill. When a stream of air blows against the blades of a windmill, the fan wheel turns and gives power to pump water or grind corn. Put the windmill wheel inside a steel cylinder and blow steam against its blades and you have the steam turbine, which drives the generators in most American electric power plants, and drives most of the world's fast ships. The gas turbine cuts out one big and expensive step. Its wheel is spun by the direct blast of the burning fuel, thus it does away with the whole elaborate steam boiler apparatus.

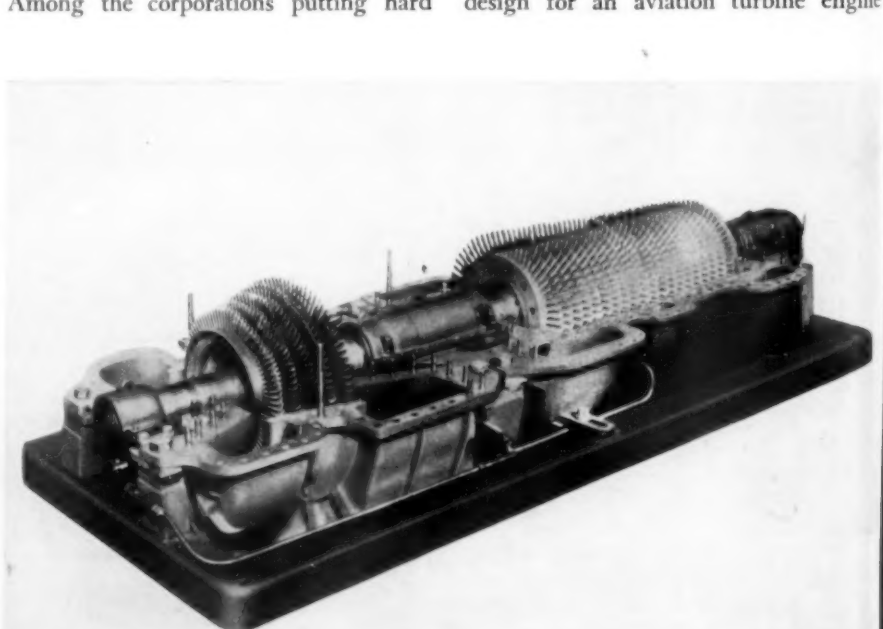
Blown Through Burner

The entire gas turbine unit is almost as simple as the principle it uses. Fuel—which may be oil, natural gas, by-product gas, perhaps even powdered coal—is caught in a blast of compressed air and blown through a burner, much like your domestic oil burner, into the turbine. The compressed air and the combustion gases, expanding mightily in the intense heat, spin the windmill. The power of the spinning shaft can either be harnessed directly to machinery or used to generate electricity.

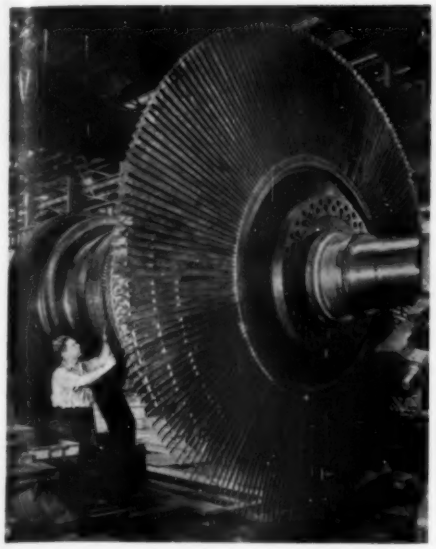
Actually, of course, a windmill compares to a gas turbine about the way a beaver dam compares to Boulder Dam—the principle is, indeed, the same, but there is considerable difference in size and in refinement of design. Gas turbine blades are not crude sails, but thousands of fins made with jeweler's precision out of alloys so expensive they might almost be called semi-precious metals. The compressor fins are shaped like miniature airplane propellor blades; rotor fins are different, but as delicate in design. Blades of both are set at the two ends of the same shaft.

This is not an inventor's dream, or something in blueprint stage. The gas turbine has arrived, unheralded, on a scale which leaves no doubt it is commercially practical. *Business Week* reported recently that there are 27 gas turbine units installed in the United States "which can be mentioned under wartime censorship," many more which cannot. Most of them produce not less than 2,000 horsepower, or 1,500 kilowatts. Some of these units are used in oil refineries. Some in Europe drive generators in electric power stations. Among the corporations putting hard cash into the development of the new engine are Allis Chalmers, Westinghouse, General Electric, De Laval, and, earliest pioneer of all, the Brown Boveri Co. of Baden, Switzerland.

Future possibilities are exciting. The gas turbine may revolutionize aviation by making really big planes possible. A 2,000 horse-power gasoline engine for aviation—biggest yet built—has 14 separate cylinders and thousands of moving parts with all the mechanical complications and lubrication problems that it implies. Designers think it may be about the practical limit. But a 2,000 horse-power gas turbine unit is too small to achieve best efficiency; many units of 5,000 horsepower are in operation and designers have blueprints ready for units of 10,000 horsepower or more. Dr. Jerome C. Hunsaker, chairman of the National Advisory Committee on Aeronautics, says "the gas turbine should eliminate a host of troubles inherent in the conventional engine—among them cooling, knocking, volatile fuel (principal fire hazard), vibration, ignition and lubrication." No plane powered with a gas turbine engine is known to exist, but before censorship clamped down, Swiss manufacturers had submitted the design for an aviation turbine engine



OLD MODEL—This is the inside view of an early gas turbine developed by Brown Boveri. The blading design for the air compressor has been improved by airfoil research for use in airplanes.



STEAM TURBINE—This great rotor, made by Westinghouse Electric & Manufacturing Company, is used in a turbine generator, producing power for war industry. The construction of the gas turbine is very similar.

both to Germany and to Great Britain.

A power plant for ships which eliminates the weight, the fresh water problem, and the vast bulk of steam boilers opens up a whole new horizon for ship designers. A Liberty ship, for example, could carry 1,000 tons more cargo if it were gas turbine powered. Or more power could be packed into a hull of given size—which promises destroyers faster than anything now on the seas.

Weight, bulk and water problems are important in locomotives, too. A gas turbine railroad locomotive in use in Switzerland has proved efficient and economical. The streamliner "City of Denver" is drawn by a four-car diesel power plant. Any one of the four cars would be big enough to contain a gas turbine unit of equal power.

Only Big One Practical

What a new kind of engine might mean to the automobile industry is the subject of speculation among engineers, some of whom say a gas turbine big enough to drive an automobile would be about the size of a shoe box, would be cheap to operate, easy to maintain. This, however, is emphatically no more than speculation. In the present state of development, only big turbines are practical at all. Further refinement of design and materials may change that situation, or may confirm the present impression that small turbines are no good.

No single inventor's name is linked with the new engine. Typical of this age, the gas turbine is the sum of the contribution of many men, working in the laboratories of great corporations —notably those of Brown Boveri.

As early as 1791, engineers toyed with the idea of a turbine spun by flaming gases. But no one could develop a model which was anything more than a laboratory toy. The turbines always used up practically all their power just in feeding themselves—that is, in driving the air compressor. In 1926, the late Dr. Aurel Stodola, of Switzerland, grandfather of all turbine experts, proved mathematically that it must always be so unless some wizard produced an air compressor which would be a lot better than anyone then dreamed possible. In 1936, the same man ran the efficiency tests on the first successful experimental model.

Key Discoveries

What had happened in the intervening ten years was that two seemingly unrelated industries had made key discoveries. Metallurgists had developed metal alloys to withstand the heat and corrosion of the flaming gases. Aviation research, working out the most efficient contours for airplane wings and propellers, had discovered principles which at last made it possible for some of Dr. Stodola's pupils to design efficient blades for the compressor. Turbine design was well understood because of the work that had been done in steam.

The Diesel has been acknowledged the world's most efficient power plant. The challenger of the champion weighs about half as much as a Diesel engine of the same power; it costs less than half as much to build; it burns fuel which is half as expensive. Powdered coal would be cheaper yet. Coal at present wears out the blades too fast, but experiments in electrically removing the gritty ash particles that do the mischief are promising. The turbine has, in effect, one moving part instead of hundreds — the crankshaft, gears, pistons, cams, connecting rods, valves and pumps of the Diesel. Maintenance is correspondingly simple. The gas turbine has no need for a cooling system or for an elaborate and expensive starter.

It has no need for the elaborate electrical ignition system of the gasoline engine, and because it has no pistons and valves jerking up and down, it is, like the steam turbine, remarkably free of vibration and easy to lubricate.

Compared with the steam turbine, it saves the weight and space of boilers, as already mentioned, and instead of using vast quantities of water — five pounds of water for every pound of coal—uses none.

A well-designed Diesel power plant has an efficiency of about 35 per cent; a steam turbine plant about 30 per cent. Gas turbines now in operation deliver about 22 percent of the heat value of the fuel as usable power. Even at that the gas turbine competes economically because its first cost is less than half and because it burns the very cheapest oil. And manufacturers assert that in new models they can guarantee Diesel efficiency.

Gas turbines now installed are operating at temperatures of 1000-1200 degrees. New ones can be built to run at 1500 degrees or more. Higher temperatures give startling and wholly disproportionate gains in efficiency. The problems, which manufacturers' announcements imply has been solved, has been to get metals which would stand the terriffic heat. Dr. Moss's turbo-supercharger, which enables American planes to fly seven miles above the earth, is a turbine operated by the exhaust of the airplane engine and its blades have to stand temperatures as high as 1800 degrees. Gas turbine designers learned much from the research on the supercharger, but it did not completely solve their problem because its metals will not stand the terrific heat for more than a few hours at a time, whereas the gas turbine installed in an industrial plant or on a ship must operate for weeks and months without a shutdown.

Secret Solution

How the solution was found is still a secret as is much else about the gas turbine. But of all the new products and new processes on which the scientists, engineers and industrialists are working in wartime, none holds more exciting promise for the postwar world than the new, revolutionary, yet tested and proved gas turbine—the first really new kind of power plant in half a century. No one who looked at the gasoline engine when it was new foretold the automobile and the airplane. No one who looks at the gas turbine today can foretell its possibilities. They may be equally breathtaking.

PUBLIC HEALTH

Nation Well Prepared For Bad Polio Year

➤ THE WORST infantile paralysis year since 1931, with new cases occurring throughout the nation at a weekly rate of 1,000 or more, would have taken a much higher toll than it has if the nation had not fortunately been well prepared with money and equipment for fighting the disease.

Credit for this life-saving preparedness is given to local chapters of the National Foundation for Infantile Paralysis in a statement by the Foundation's president, Basil O'Connor. Mr. O'Connor has just returned from a transcontinental trip in which he visited some of the stricken areas, including California and Chicago where the outbreaks have been particularly serious.

"Americans helping other Americans with money given freely" during the public celebrations of President Roosevelt's birthday last January 30, Mr. O'Connor said, is what made it possible for communities to have on hand both equipment and trained personnel for immediate action when the epidemic struck.

Science News Letter, October 9, 1943

NUTRITION—CHEMISTRY

Need Insoluble B Vitamins For Enriching White Rice

➤ WANTED: Insoluble forms of three B vitamins that can be used for enriching white rice and hominy grits.

It is not worded quite that way, but that is the gist of a statement from Dr. Frank L. Gunderson, secretary of the food and nutrition board of the National Research Council (*Science*, Sept. 24)

Corn grits and white rice, he points out, cannot be enriched with thiamin, niacin and riboflavin, as flour and other cereals can, because of certain practical difficulties. Yet these two cereal foods, staple in the diet of large sections of the population, need enrichment with vitamins, just as white flour does when it forms a large part of the daily diet.

One practical difficulty in the way of enriching grits and white rice, Dr. Gunderson points out, is due to the fact that these three B vitamins are soluble in water. If they were sprayed onto the outside of the rice or grits particles, they would be washed off and lost in the rinsing with water which most housewives give these foods before cooking them.

Methods are being developed for putting the water-soluble vitamins into special granules of a size and texture like that of the grits and rice respectively. These special vitamin-carrying granules would be mixed with suitable amounts of the rice or grits the housewife bought. The method, however, has certain disadvantages, Dr. Gunderson states.

Consequently the National Research Council's food and nutrition board "commends to the attention" of laboratories of chemical and cereal industries, universities and experiment stations, the desirability of finding a solution to the problem by developing insoluble forms of the vitamins.

Science News Letter, October 9, 1943

MEDICINE

Synthetic Sex Hormone Gives Favorable Results

➤ FAVORABLE results in treating women with a new synthetic female sex hormone are reported independently by Dr. Alvin Ray Hufford, of Grand Rapids, Mich., and Dr. Harold K. Roberts, Dr. Ellen Loeffel and Dr. Cyril M. MacBryde, of St. Louis. (*Journal, American Medical Association*, Oct. 2)

The new synthetic hormone is called octofollin and was developed at the Research Laboratories of Schieffelin and Co., New York. It can be given either by mouth or by hypodermic injection for relief of the distressing symptoms that afflict many women in late middle life when the body stops supplying the natural hormone.

"Prolonged beneficial effects" without nausea, headache or other side-effects from the drug were obtained by Dr. Hufford in the 21 patients to whom he gave octofollin by hypodermic injection.

The St. Louis doctors gave the drug by mouth instead of hypodermic injection and report relief of symptoms in the majority of 44 women. They also report no nausea nor any other signs of poisonous effect of the drug.

The drug is more expensive per milligram than another synthetic sex hormone, diethylstilbestrol, they point out, and when given by mouth comparatively large doses of octofollin are required. Octofollin, however, is less expensive in the amount needed to achieve results, than preparations of "natural" sex hormone that can be given by mouth.

Chemical name for the drug is 2-4-di (parahydroxyphenyl)-3-ethyl hexane.

Science News Letter, October 9, 1943

IN SCIEN

PUBLIC HEALTH

Infantile Paralysis Now Past Peak

➤ INFANTILE PARALYSIS cases throughout the nation decreased from a total of 1,020 the week ending Sept. 18 to 818 the week ending Sept. 25, reports to the U. S. Public Health Service show. Health authorities believe the epidemic is now past its peak.

Decreases were reported from all but six states: New Jersey, Wisconsin, Minnesota, Arizona, Utah and Oregon. The only substantial increase was in Minnesota, from 10 to 23.

In Illinois, where the epidemic had been particularly fierce, cases dropped from 208 to 140. Texas, one of the first states to feel the epidemic, reported a decrease from 57 to 41. Cases in California, another hard hit state, dropped from 150 to 117.

Science News Letter, October 9, 1943

BOTANY

Night Temperature Affects Blossoming of Plants

➤ NEW EVIDENCE of the importance of night-time temperature on blossom induction and other activities of a number of plants is reported by Dr. R. H. Roberts, of the University of Wisconsin (*Science*, Sept. 17).

With a night temperature of 75 degrees Fahrenheit and a daytime temperature of 55 degrees Fahrenheit, the plants had a pale color, warm-climate plants particularly being near a yellowish "grapefruit" shade. Cool climate plants, on the other hand, developed a relatively good green color in cool days following warm nights.

The plants with pale color because of cool days following warm nights grew relatively little compared with plants on a warm day and either warm or cool night schedule. They did, however, have practically normal blossom induction.

Flowering, setting of seed and root formation were other plant activities affected by the warm-night-cool-day schedule in the cases of certain plants. A masking of potato virus symptoms also occurred as a result of certain temperature schedules.

Science News Letter, October 9, 1943

NE FIELDS

AGRICULTURE

Pre-Harvest Drop of Fruit Prevented By New Spray

➤ FEWER apples and pears fall from their trees before ripe if new sprays and dusts developed by the U. S. Department of Agriculture are used during the growing season. After four years of experimentation with satisfactory results, the procedure is now announced to the public.

The first orchard tests were made in June, 1939, on an early summer variety of apple. The result was striking. In only two days two bushels of windfall apples were picked up from under two untreated trees, and only 12 apples from under two treated trees. Later tests gave similar results. It has now been tested on 100,000 acres of orchards.

The spray is principally alpha-naphthalene-acetic acid. One teaspoon of the chemical is used with 200 gallons of water. It is now available commercially.

Science News Letter, October 9, 1943

MEDICINE

Plasma Declared Best Of All Blood Substitutes

➤ PLASMA is and probably will continue to be the best of all the so-called blood substitutes, Dr. John B. Alsever, U. S. Public Health Service surgeon serving as technical director of the blood plasma section of the Office of Civilian Defense, declared at the meeting of the Medical Society of the District of Columbia.

Human serum albumin is the newest blood derivative now being used by the armed forces. It is not available for civilian use, nor does there seem any reason why it should be. It is hard to make, more expensive than plasma, and does nothing that plasma does not do, Dr. Alsever explained. Its great advantage for military use is the saving in transportation space. It is packaged in vials less than one-fourth the size of those required to carry an equivalent amount of plasma.

Plasma, serum and serum albumin should be called blood derivatives, not blood substitutes, Dr. Alsever said, because none of these can take the place of whole blood.

Whole blood is first choice for treating shock from injuries in which there has been hemorrhage, although sometimes plasma must be used in these cases until whole blood is available.

Plasma is first choice, on the other hand, in treating shock in burns and crush syndrome.

Pectin and gelatin, on which much research is being done, are not blood derivatives and cannot be truly considered as plasma substitutes, Dr. Alsever stated. Even if further perfected, he does not think they will ever become more than temporary emergency aids in treatment of shock. Recent findings suggest that gelatin, in particular, shows promise of eventually becoming useful.

Science News Letter, October 9, 1943

PHARMACY

Remington Medal Awarded Leader in Health Programs

➤ ACHIEVEMENT in pharmacy for the betterment of public health has won the Remington Honor Medal for Dr. Robert P. Fischelis of Trenton, N. J., it was announced in Brooklyn by Dr. Hugo H. Schaefer, secretary of the Remington Medal Committee.

Dr. Fischelis, the twenty-second Remington Medalist, organized and heads the Chemicals, Drugs and Health Supplies Branch of WPB's Office of Civilian Requirements and is secretary and chief chemist of the New Jersey Board of Pharmacy.

Science News Letter, October 9, 1943

CHEMISTRY

Chemical Society Prize Awarded to Young Professor

➤ THE $1,000 PRIZE of the American Chemical Society, designed as a recognition and encouragement for the younger men in the profession, was awarded to Dr. Kenneth S. Pitzer, 29-year-old University of California faculty member, at the Society's annual fall meeting.

Despite Dr. Pitzer's youth, he already has more than 40 scientific publications to his credit. His researches have been primarily in the field of chemical thermodynamics. Some of his researches, notably those on benzene, toluene and the xylenes, have ultimate bearing on the use of petroleum and its products.

At present, like practically all chemists, Dr. Pitzer is at work on war problems.

Science News Letter, October 9, 1943

AERONAUTICS

Heater for Gun Turrets Also Prevents Frost

➤ HARD-TO-HEAT gun turrets with transparent plastic domes, such as those found on the big bombers, may provide more comfort and clearer vision for gunners if the heating plan invented by Lynn A. Williams, Jr., of Northfield, Ill., proves successful. He has asaigned his rights to patent no. 2,330,322 to the Stewart-Warner Corporation.

A heater, preferably of the internal combustion type, is fastened to the outside wall of the compartment. Heated air is shot through a manifold by a blower into a passageway around the wall, then emerges from many fishtail-shaped nozzles placed in a circle on the lower edge of the turrent dome. Flowing upward in thin layers along the walls, the heated air prevents frost or moisture condensation which would obscure the view of the gunner.

Science News Letter, October 9, 1943

ENGINEERING

Airplane Worker Needs Skill of Artist, Engineer

See Front Cover

➤ THE SKILLED WORKER shown on the front cover of this week's SCIENCE NEWS LETTER must combine the delicate touch of an artist with the precision accuracy of an engineer. He is using a high-speed rotary burr to smooth the sharp edges of a reduction gear for a war plane but he must not change, even minutely, the gear's profile. Finished, the gear will fit accurately into its place in a Wright Cyclone airplane engine.

Science News Letter, October 9, 1943

INVENTION

Welding Generator Made With Automatic Start-Stop

➤ AN AUTOMATIC welding generator that starts as soon as the operator tries to weld and cuts off a short time after welding has stopped is the subject of patent No. 2,328,596 granted to Thomas W. Winsor of Bremerton, Wash. The device saves power and unnecessary wear by eliminating idle running. Essential parts of the device are a motor starter operated magnetically, a magnetic switch which opens and closes the circuit, and series and time relays.

Science News Letter, October 9, 1943

MEDICINE

Hospitalization Urged

Immediate intensive treatment seen as best solution for syphilis problem for the duration of the war. Clinic patients often not cooperative.

➤ FOR THE duration of the war, at least, all uncooperative patients with early syphilis who come to public health clinics should be put into hospitals and treated by one of the intensive methods, in the opinion of Dr. H. N. Cole, Dr. E. B. Heisel and Dr. George Stroud III, of Cleveland.

The crux of the syphilis problem, they point out (*Journal, American Medical Association,* Oct. 2), is that the disease is most prevalent among the most ignorant and least cooperative part of the population. These patients will come to the clinic for a few treatments and then stop coming in spite of all efforts to keep them returning until they have had enough treatment to cure them or at least make them non-infectious. In Cleveland these patients not only stop coming to the clinic but get lost "so effectually that not even their draft boards can find them."

The intensive treatment methods are those in which the total amount of arsenicals believed necessary to cure a a patient is given in a relatively short time, either by continuous drip into the vein or by repeated single injections of large doses. In some methods, fever treatment is combined with the medical treatment. With these methods, the Cleveland doctors point out, the doctor is at least sure that when the patient leaves the hospital he or she has the necessary amount of medicine "under his or her skin."

A certain number of patients will relapse after these intensive, short time treatments, whereas with the slower 18 months schedule relapses are believed to be few in those who complete the full course of treatment. The number who relapse after the short, intensive treatment schedule, the Cleveland doctors state, will be small compared to the number who stop treatment too soon on the slower schedule.

Science News Letter, October 9, 1943

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ENGINEERING

Non-Skid Plastic Contains Particles of Garnets

➤ NON-SLIP DECK covering on battleships, particularly around the great guns, which eliminate largely the hazard to men passing the ammunition, has recently been developed, thoroughly tested, and now is in use. Garnets, pulverized into course grains, supply the non-skid property.

This new deck covering, which is now fire-proof as well as non-skid, was developed by the Goodyear Research Laboratory, Akron, Ohio. It is manufactured by the Goodyear Tire and Rubber Co. It replaces the older battleship linoleum, sand boxes and special paints formerly used.

The new material consists of abrasive particles held in a special plastic synthetic resin binder that has the ability to stick to the smooth steel surface of a battleship or similar structure. It can be applied with a trowel or, more quickly, by spraying it with an ordinary spray gun.

The abrasive particles used in the plastic are usually ground garnets. Alundum may be used also. This is a product obtained by fusing aluminum oxide in an electric furnace. It, like the garnets, when reduced to coarse grains or particles, sometimes called grits, has exceedingly sharp hard edges and corners which add greatly to the non-skid characteristics.

The coating of this garnet-holding plastic which is applied to the decks is about ten times as thick as coatings of paint. The hard abrasive particles carry the weight of passing bodies making the covering durable with unusual wearing qualities.

The material as shipped is a viscous fluid in metal containers ready for use. It can be applied to steel, wood and concrete. It dries in a few hours. Low temperatures do not affect it, nor do ordinary high temperatures encountered in hot climates. It resists the corrosive action of oil, salt, sulfur, soap and other scrubbing materials.

Science News Letter, October 9, 1943

PHYSICS

National Center Purchased For Physics Profession

➤ A NATIONAL center for the physics profession will be established in a building just purchased in New York City, the American Institute of Physics has announced.

It will serve as the hub of scientific activities in physics which are playing an important part in the war and promise major post-war industrial developments. Rapid growth of the profession in the last 20 years made the move from rented space necessary, it was pointed out.

A campaign is now being conducted among American physicists and friends of physics to finance the project.

Science News Letter, October 9, 1943

PHYSIOLOGY

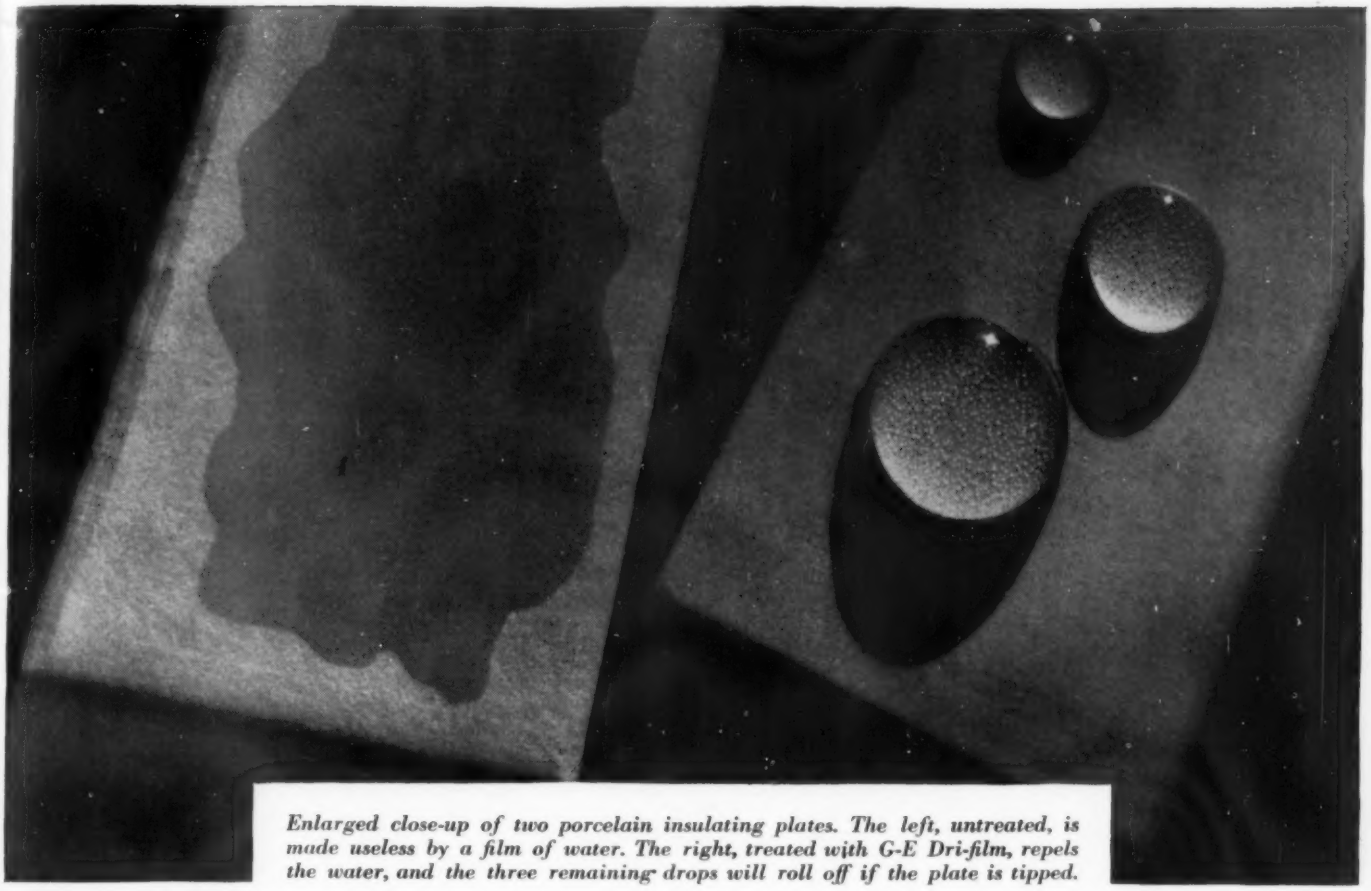
Drivers Over 40 Should Have Their Eyes Tested

➤ DRIVERS over 40 should have their eyes tested more frequently than younger drivers as a precaution against driving hazards due to visual defects, according to a report issued by the American Automobile Association.

Every fifth person applying for a driver's license wears glasses, but it was found that three out of every five persons applying for a driver's license at the age of 60 wear glasses.

For those under 40, every eighth person wears glasses. This proportion holds true irrespective of whether the 20-year or 40-year group is considered. But the number using glasses increases rapidly after 40.

Science News Letter, October 9, 1943



Enlarged close-up of two porcelain insulating plates. The left, untreated, is made useless by a film of water. The right, treated with G-E Dri-film, repels the water, and the three remaining drops will roll off if the plate is tipped.

How to cure a Flying Radio's LARYNGITIS

THERE USED TO BE a lot of trouble, every time an American pilot in a dogfight dropped a radio set 20,000 feet. Not crash trouble, for in the cases we're talking about the radio was in the plane and the pilot pulled out of the dive.

But sometimes the radio lost its voice. For the sudden plunge from cold to warmer air produced condensation of moisture—like the fog that collects on your glasses when you come indoors on a winter's day. A film of moisture formed on the radio's insulators; the film let the electricity leak away; the radio quit dead! And that was bad—since a modern fighting plane depends almost as much on its radio as it does on its wings.

But not so long ago General Electric scientists found a way around this difficulty. For if a porcelain insulator is exposed, for just a few seconds, to the vapor of a composition called G-E Dri-film—then the whole nature of the insulator's surface is changed. It looks just the same, but moisture doesn't gather any longer in a conducting film. Instead, it collects in isolated droplets that don't bother the radio a bit. The set keeps right on talking.

Today the voices of most military radios are being safeguarded by treating their insulators with G-E Dri-film. And the research that cures a radio's laryngitis is the same kind that has licked the problems of the turbosupercharger, and has packed the driving power of a destroyer into turbines not much bigger than a couple of trunks. It's the kind of research we're counting on, tomorrow, to turn the discoveries of wartime into peacetime products we can all use. *General Electric Company, Schenectady, N. Y.*

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AERONAUTICS

Planes Made Safer

Auxiliary power plants may eliminate maze of wires and pipes when generators are driven by the main engines. First installation in PBY.

➤ AUXILIARY power plants have been put on several types of warplanes during the past year and their post-war use will be expanded to provide safer flying, Blake Reynolds of the Lawrance Engineering and Research Corporation reported to the meeting of the Society of Automotive Engineers in Los Angeles.

"On the basis of its present performance and uses," he stated, "and in view of the trends which are currently being established it is safe to predict that the auxiliary power plant will be standard equipment on many large and small planes, operating either in combination with main-engine generators or as a sole source of electric power."

If the generators driven by the main engines were completely replaced by the auxiliary type, a great maze of pipes and wires could be removed from the rear of the engines which now "hampers maintenance and impairs reliability," it was pointed out. This would also permit the use of lighter generators as a result of removing them from the severe vibration encountered at the rear of the main engines.

Use of auxiliary power plants was first proposed only about nine years ago; they have since been known as "putt putts" because of the sound made by the engine exhaust on the first model.

The first installation was made on the Navy's PBY flying boat which "served to demonstrate the reliability and flexibility of this source of power." The Army is now installing the units in big bombers, marking a new trend. Development has been largely in the Navy where sea-going planes have more need for auxiliary power than the Army because of the greater importance of radio and because ground power is not usually available before take-off.

"A year ago there was merely a handful of planes which could boast auxiliary power," Mr. Reynolds said. "There are now several others which give proof of the ever-widening usage of auxiliary power. Long a proponent of auxiliary power plants, the Navy is again demonstrating its confidence in their reliability, as it did some four years ago by installing two units as the sole source of electric power in the flying boats."

Science News Letter, October 9, 1943

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AERONAUTICS

New Tricycle Landing Gear Invented for Airplanes

➤ PROMISE of a "happy landing" for America's planes is found in a retractable, steerable, tricycle landing gear, which does away with bothersome landing-gear shimmy. It was invented by John B. Wassall of Burbank, Calif., and Wilfred N. Wallace of Glendale, Calif. who assign rights in the patent (2,329,168) to the Vega Aircraft Corporation.

Three-wheeled gear, seen on the old crates of early flying days, has been returning to favor after a long period of neglect. Its advantages for modern aircraft is that the third wheel near the front prevents many a nose-over during landing, and keeps the craft in the same horizontal position on the ground as is normal in flight. Merits of the tricycle show up especially well at high landing speeds and when there is uneven wheel braking.

"However, very few satisfactory arrangements of retractable tricycle landing gears have been either proposed or built," the inventors maintain, "as a result of difficulties encountered in arresting shimmying, providing suitable steering mechanism, stowage space, points of attachment and other conditions."

The new tricycle gear controls shimmy by hydraulic damping. A hydraulic motor provides steering power to the front wheel, instead of to a tail skid or wheel. Hydraulic power also pulls the gear into the plane's belly during flight for modern streamlining. The landing gear is adapted to support the weight of the aircraft in emergencies, however, even though the gear may stay retracted.

Science News Letter, October 9, 1943

ENGINEERING

Rescue Device Invented for Entrapped Submarine Crew

➤ FOR THOSE who fight beneath the surface of the seas, a special lifeboat for submarines has been invented by John F. Donnelly of Oakland, Calif. (patent no. 2,330,477).

The air-tight boat, shaped like a box, is set in a well in the submarine deck, the top being flush with the outer hull. When a crippled submarine finds itself unable to rise, the entrapped crew crawls into the rescue boat through a tube connecting with the main part of the sub. The tube is disconnected and closed, a wheel is spun which unbolts the life boat, and the buoyant box floats to the surface. Then the hatches and portholes may be opened.

Science News Letter, October 9, 1943

MATHEMATICS DICTIONARY

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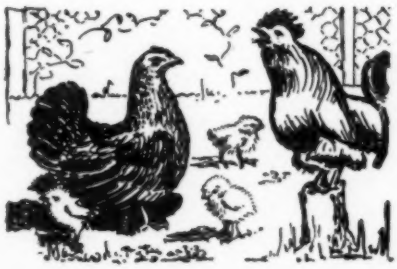
This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one."

Available in flexible or non-flexible binding, for $3.00, from the Digest Press, Dept. 3-B, Van Nuys, California, or Science News Letter.

BIOLOGY

NATURE RAMBLINGS

by Frank Thone



The Simplicity of Sex

➤ SEX is a really simple phenomenon in its biological basis. Bi-parental reproduction in plants and animals is essentially the utilization of two pieces of protoplasm, detached from different individuals, which are mixed together to start the new individual. There is a terrific amount of fuss and emotion, and whole libraries full of sociology and moral theology and poetry and drama, about the subject of Sex, but at the ultimate biological bottom of the business it is just that simple thing: two separate bits of protoplasm mixed together to form a new individual.

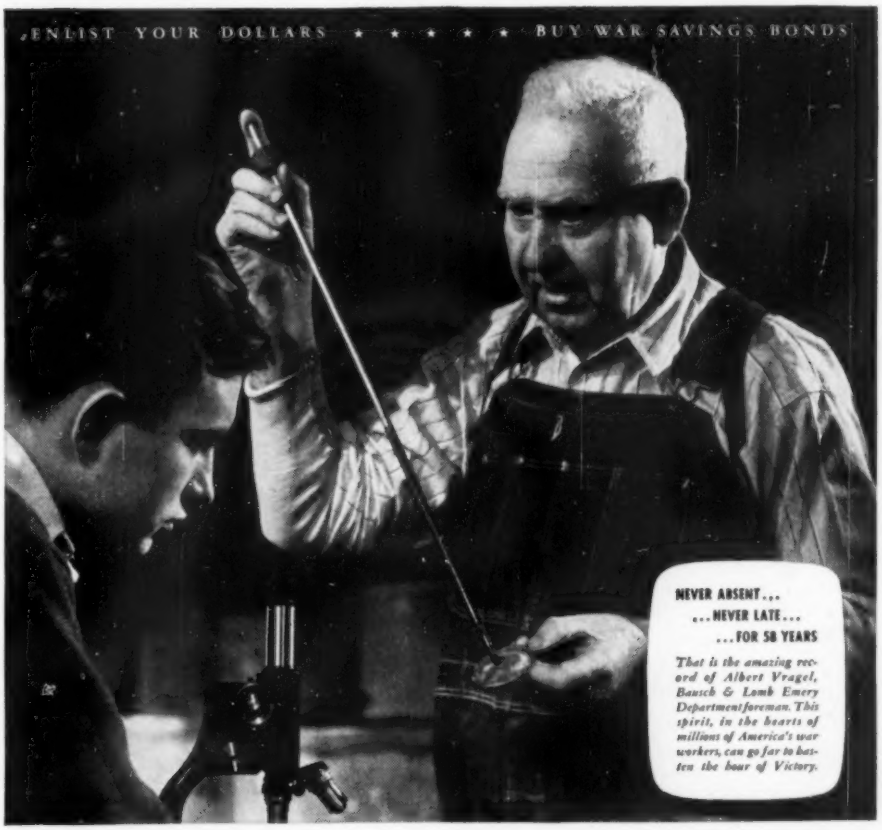
Just why this bi-parental mode of reproduction should have come into operation in the living world, and especially why it should have come to be the exclusive method among the higher animals, is still pretty much of a riddle to science. Numbers of answers have been proposed, and while some of them are fairly satisfactory none of them can be fairly called conclusive. "The way of a man with a maid" is still just about as much a mystery to us as it was to Solomon.

It has been alleged that greater vigor in the offspring results from the sexual than from the asexual mode of reproduction. This, however, seems difficult to prove. Certainly there is no lack of vigor in the bacteria, which so far as we know always reproduce asexually, by simple division. Many other kinds of lower organisms go along for many generations without any kind of bi-parental reproduction.

Origin from two parents instead of one does, however, result in more rapid variation in lines of descent. When you divide a single piece of protoplasm into two or more pieces and make a new organism out of each piece, it is exceedingly seldom that the offspring will be different in any way from the parent. We take advantage of this lack of variability in asexual reproduction when we propagate plants by cuttings, grafts, bulbs, etc. Cuttings from an American Beauty rose always produce American Beauties, grafts from a Jonathan apple always bear Jonathans.

But when you start with two batches of differing parental material, the mixture will contain a mosaic or blending of the different hereditary traits possessed by the parents. You need only look at any human family, or any litter of puppies or kittens, to see that. And although individual differences are less marked among the lower organisms with which we are immediately concerned here, they do exist, and their mixing in bi-parental reproduction probably has had a good deal to do with the long process of evolutionary change.

Science News Letter, October 9, 1943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ENTOMOLOGY

Insect Saboteurs

Japanese beetles and Hessian flies aid the enemy by damaging American food crops. Destruction by other insect pests reported not severe

➤ HESSIAN FLIES and Japanese beetles are enemy helpers destroying American war food crops this year as in other years. A U. S. Department of Agriculture survey just completed shows the Hessian fly, which specializes on wheat, active but under reasonable control. Steps must be taken now to control 1944 activities.

In general, the survey reports "Hessian fly infestations are low throughout the winter wheat belt." There are exceptions, however. Menacing populations of Hessian flies are found in many local fields and areas, including widespread areas in eastern Kansas, southeastern Nebraska, western New York, eastern Pennsylvania, New Jersey, northwestern South Carolina and in certain counties in California.

"For this reason," the report advises wheat growers, "it is advisable to continue to observe the safe-seeding dates and recommended controls for the fly rather than to hazard the chance of a rapid multiplication of the fly during the season with resultant widespread injury to the 1944 wheat crop."

The Hessian fly is of Asiatic origin, but it spread to Europe and was brought to America by Hessian soldiers during the Revolutionary War. In a hundred years it reached the Pacific coast.

War products of American farms have had what might be called an average year with their insect enemies. Mexican bean beetles have done much damage during the past growing season. The screwworm infestation on cattle throughout much of the South, including Texas and Oklahoma, has been severe.

Armyworms which destroy almost any type of vegetation have been severe in peanuts, soybeans and grasses in the South, and reported on Long Island. The cotton boll weevil met hot dry weather, which was unfavorable for any unusual activities. The cotton leafworm spread slowly and the infestation was not serious.

European corn borers have done severe damage in all the infested areas. The corn earworm was not as abundant as usual. The lesser cornstalk borer has done much damage to canning beans in southwestern Missouri and in Oklahoma.

Science News Letter, October 9, 1943

CHEMISTRY-MEDICINE

Most Carotene in Blood During Month of October

➤ THIS MONTH the amount of carotene in your blood will probably reach its highest level of the year, it appears from studies reported by Dr. Samuel W. Clausen, Dr. Augusta B. McCoord, Berenice P. Farber and Chris P. Katsampes, of the University of Rochester School of Medicine, at the meeting of the American Chemical Society.

Carotene is the yellow pigment of fruits and vegetables which the body converts into vitamin A. You get the vitamin directly from such foods as butter, milk, eggs, liver and fish liver oil, but the vegetable stocks of carotene are an important supply source.

The Rochester scientists examined the blood of seven women and 14 men on the first of each month for an entire year. The men and women were all eating a good average diet during the year. The highest amounts of both carotene and of another vegetable pigment, xanthophyll, were found in their blood in the autumn months, especially October, when fresh vegetables and fruits are cheap.

"Surprisingly enough," Dr. Clausen said, "the concentration of vitamin A in the blood changed little during the different seasons; that is, the vitamin A seemed to be independent of the amount of its provitamin, carotene, which was in the blood. We know, however, that in normal persons there is a large store of vitamin A in the liver. It may be that the healthy body is able to draw upon this store when vitamin A is lacking in the food, and so keep the vitamin A of the blood at the needed constant level throughout the year."

Carotene was lowest in the bloodstream in late spring, April and May, when fresh fruits and vegetables were difficult to obtain. Commenting on this, Dr. Clausen added:

"The vegetables being raised in hundreds of thousands of Victory gardens will help greatly in supplying the carotene needed by everyone."

Science News Letter, October 9, 1943

From 200 to 400 pounds of *fish* per year can be supplied by a farm pond one acre in extent if properly managed and located where favorable conditions exist.

With the Japanese occupation of the East Indies, annual imports to the United States of over a billion pounds of *cocanut oil* and other fats and oils were cut off.

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PUBLIC HEALTH

Doctors Scarce at Home

The shortage of doctors for civilians is expected to continue unless the Army and Navy revise their requirements. Thus far health on the home front is in good shape.

➤ "THE SHORTAGE of doctors for civilian practice will continue to increase indefinitely unless the requirements of the armed forces are revised," the Office of War Information declared in a report of facts from the U. S. Public Health Service, the War Manpower Commission and the Federal Works Agency.

Civilian health so far, however, is in good shape "despite critical shortages at many points in the medical defenses of the nation."

The lowest death rate on record for 1942 and a decrease in maternal and infant mortality in spite of an increased birth rate in the same year give a rosy color to the health picture. So do the below-peacetime average cases of influenza and typhoid fever in 1942, normally danger points under war conditions.

A more somber color to the picture of the nation's health appears from the slightly less favorable general death rate this year; the infantile paralysis epidemic and the sharp increase in meningitis; the flareups of smallpox, and the sporadic outbreaks of food poisoning and dysenteries; and the statistics on a sampling of workers, concerning sicknesses which caused absences of longer than eight days, showing an increased number of man-days lost, especially from respiratory sickness, which include colds, influenza, pneumonia and so on.

The predicted indefinitely continued doctor shortage for civilians arises from two facts:

1. The armed forces have so far commissioned only a little more than 80% of their stated needs and are continuing to withdraw physicians from civilian practice.

2. Eighty per cent of all new medical graduates will be commissioned. This leaves 1,500 new doctors for civilians unless the armed forces take more than 80% of new graduates, and 1,500, OWI points out, would supply only about half the number needed to replace the 2,500 to 3,000 doctors who die in the average peace-time year.

"Although it is logical to expect a larger number of deaths in war years from the strains of overwork," the OWI statement continues, "there is no evidence of this to date."

The U. S. Public Health Service and the Procurement and Assignment Service of the War Manpower Commission are attempting to compensate for the doctor shortage in the following ways:

1. Surveys to show where needs are acute. 2. Attempts to shift doctors from well-supplied to medically needy areas. 3. Limiting recruitment to 20 states and the District of Columbia which are relatively well supplied with doctors. 4. Helping local authorities to organize cooperative use of doctors and facilities. 5. Improving and increasing hospital and clinical facilities. 6. Continuing attempts to improve sanitary conditions. 7. Extensive work to control the spread of venereal disease. 8. Widespread case-finding work in tuberculosis.

Science News Letter, October 9, 1943

INVENTION

Modified Windshield Wiper Invented for Eyeglasses

➤ MILLIONS of Americans have, perhaps, been waiting for an invention such as that of Isidor Greenfield, Brooklyn, N. Y., who has put a modified windshield wiper on eyeglasses. He has received patent No. 2,329,757 on his device which would banish the annoyance of taking off eyeglasses to clean fogged or dirty lenses.

The simple, inexpensive wiper can be quickly attached to, or removed from, the top of the spectacle frames; two legs of springy wire extending downward are covered with a glass-cleaning material. When rotated, the unit wipes the lenses on both sides.

Science News Letter, October 9, 1943

BACTERIOLOGY

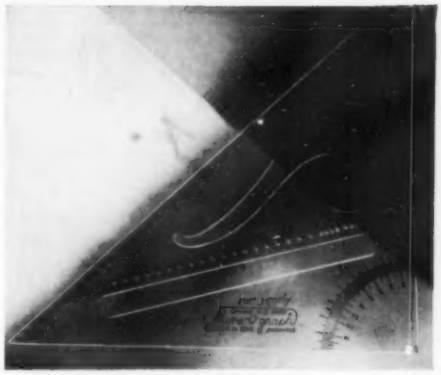
Agar Supply Sufficient For Bacteriological Use

➤ THANKS to production of agar on the Pacific Coast and to careful use of the quantities available, America has enough agar for the essential bacteriological media needed in medical laboratories.

This jelly-like substance made from seaweed was a Japanese product before the war, but agar of bacteriological grade is now being successfully extracted from seaweed of our Pacific Coast. A WPB limitation order prevents the use of the limited supply for industrial, food or therapeutic purposes.

A new agar industry on the Atlantic Coast is getting underway but so far its product is not suitable for bacteriological use. There is hope that in the near future we may again be having meringue for pies made from material contained in seaweed.

Science News Letter, October 9, 1943



***VERSATILE** — This draftsman's tool, made of "Lumarith," includes among other features markings for a ten-inch rule; a straight edge; angles of 15, 30, 45, 60, 75 and 90 degrees; a French curve; graduation markings; and holes for use in drawing parallel lines.*

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• New Machines and Gadgets •

❁ *PADLESS crown caps for bottles or cans, recently patented, require no rubber, cork or other sealing material. A slightly lowered, flat center, which fits the neck of the bottle, plus a crimped edge makes an airtight seal when the cap is pressed into position.*

❁ *WOODEN PEGS and collets made of small, hollow cylinders may replace nails in fruit and vegetable boxes. The collets, quarter-sawed part of their length, are wet with glue and inserted in holes. Tapered pegs are then driven into the hollow centers.*

❁ *TRANSPARENT plastic sheeting is furnished Army officers to protect field maps. An adhesive back holds the sheet permanently in place over the map. It protects against moisture, grease, dust and sand.*

❁ *PAYROLL TAX deductions are made in a flash with a cardboard device. A rotary disk is set to fit the employee's marital status, wage, and pay period. It then shows the amount to be deducted. The gadget will be sent free to employers requesting it from the manufacturer.*

❁ *JAR SEALING RINGS made of non-critical materials to take the place of rubber rings are now available. The picture shows on the left a ring made of a thermoplastic, and on the right rings made from a vulcanized linseed oil compound combined with secret ingredients.*

❁ *LIFEBOAT housekeeping has been simplified by a portable "kitchen" which includes a still for obtaining drinking water from the ocean and cooking facilities as well. A solid non-explosive compound is used as fuel which burns without melting, thus reducing the fire hazard. Thousands of the units are now being produced for the U. S. Navy.*

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 177.*

• Just Off the Press •

ADVANCED QUANTITATIVE ANALYSIS—Hobart H. Willard and Harvey Diehl—*Van Nostrand,* illus., 457 p., $4.75. A textbook which also serves as a companion volume to Elementary Quantitative Analysis by H. H. Willard and N. H. Furman.

THE ADVANCEMENT OF SCIENCE, Vol. II, No. 8—*British Ass'n for the Advancement of Science,* 92 p., 5 shillings. This publication contains the records of two conferences of the BAAS, one on "Science and the Citizen" and the other on "Cooperative Systems in European Agriculture," and two committee reports; "Mineral Resources and the Atlantic Charter" and "Scientific Research on Human Institutions."

THE APOTHECARY CHEMIST: CARL WILHELM SCHEELE—George Urdang—*American Institute of Pharmacy,* 71 p., illus., $1.25. A pictorial life history of the pioneer scientist with biographical sketch and timetable of his experiments.

CALCULUS—Lyman M. Kells *Prentice-Hall* —509 p., illus., $3.75.

CHEMISTRY MADE EASY—Cornelia T. Snell and Foster Dee Snell—*Van Nostrand,* illus., 4 volumes, Vol. 1, 184 p. The Theory of Inorganic Chemistry; Vol. 2, 232 p., Elements and Compounds in Inorganic Chemistry; Vol. 3, 256 p., The Aliphatic and Aromatic Compounds of Organic Chemistry; Vol. 4, 542 p., Chemicals of Commerce. $7.95. The books are designed for home study use. But the authors advise that no experiments be performed without the guidance of an expert or instructor near at hand.

THE DRYING OF RAYON—Howard P. Simons and others—*Ohio State University,* illus., 171 p., 50 c. postpaid. Bulletin no. 116, 1943.

ENCLYCLOPEDIA OF SUBSTITUTES AND SYNTHETICS—Morris D. Schoengold, ed.—*Philosophical Library,* 382 p., $10. This encyclopedia should prove useful to industrial and laboratory chemists who are in search of new and improved materials.

THE EXCAVATION OF TELL BEIT MIRSUM: VOL. III: THE IRON AGE—William F. Albright—*American Schools of Oriental Research,* illus. 229 p., $4. Price correction.

FARM MANAGEMENT RESEARCH 1940-1941: A Report by the Subcommittee on Farm Management—W. W. Wilcox, S. E. Johnson, S. W. Warren—*Social Science Research Council,* 60 p., 70c., Bulletin 52, 1943.

GOING FISHING—Negley Farson—*Harcourt, Brace,* 148 p., illus., $3. The author's fishing experiences in his travels from one part of the world to another.

LABORATORY PRACTICE OF ORGANIC CHEMISTRY — G. Ross Robertson — *Macmillan,* 367 p., illus., $2.50. Rev. ed.

METAL FORMING BY FLEXIBLE TOOLS—Chris J. Frey and Stanley S. Kogut—*Pitman,* illus., 193 p., $3. The book supplies information on the production techniques that have had marked success in the aircraft industries. The future extension for various sheet metal industries is also foreseen.

METALS AND ALLOYS DATA BOOK—Samuel L. Hoyt—*Reinhold,* 334 p., illus., $4.75

SEMIMICRO QUALITATIVE ANALYSIS: A Course in Applied Chemical Equilibrium —John F. Flagg and Willard R. Line—*Van Nostrand,* illus., 140 p., $1.50.

SOCIAL WELFARE AND NARCOTICS — Lou Adna Sours—*Meador,* 187 p., $2. For teachers, parents and social workers. Frankly propaganda against intemperance, particularly in narcotics.

TRAIL BLAZERS TO RADIONICS AND REFERENCE GUIDE TO ULTRA HIGH FREQUENCIES—compiled by E. Kelsey—56 p., *Zenith Radio Corporation,* free upon direct request.

WAR AND EDUCATION — Porter Sargent — *Porter Sargent,* 506 p., $4.

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